

Fiber Optic Array Electrical Splice Manufacturing Technology

Status: Transitioned

PROBLEM / OBJECTIVE

The previous process for integrating the hydrophone to the undersea array cable requires systematically removing a one-inch section of the cable jacket, fishing out the three sets of twisted pair wires, cutting the wires, and soldering a "T" to tap into one pair of wires. The leads from the hydrophone are then soldered to the tap and packaged next to the cable followed by an epoxy potting procedure, which encapsulates the joint. Polyurethane overmold is applied to ensure water tightness and allow flexibility. This process is labor intensive and increases the risk of water intrusion that could render the entire array useless. In addition, there is risk of damage to the ruggedized optical fiber, which is bundled with the twisted pairs. A more automated process reduces the touch labor costs and results in higher array fabrication yields, leading to a substantial reduction in the Unit Production Cost of the system.

ACCOMPLISHMENTS / PAYOFF

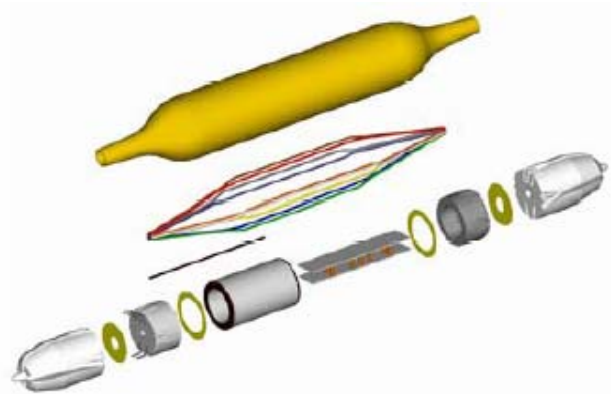
Process Improvement:

The goals of this project are to develop a method or methods to streamline and automate the attachment of piezo-electric hydrophones to an undersea cable in such a way that reduces the array fabrication time and provides a reliable watertight assembly. The methods developed in this project reduced the unit touch labor costs 68% and improved the yield of the fabrication process and the survivability of the array.

Expected Benefits:

- Decrease assembly and welding time and effort associated with collars by 20%. (Cost avoidance)
- Reduce number of collars required for DD(X) by approximately 10,000 collars. (Cost avoidance, materials savings)

Navy ManTech Program
BMP SS Project Title Rev # MMMYY



ASDS Sensor Display

- Cost avoidance of approximately \$750,000 per hull.
- A weight savings of approximately 50,000 pounds per hull. (System performance enhancement)

TIME LINE / MILESTONE

Start Date: March 2001
End Date: February 2003

FUNDING

Navy ManTech - \$1.8M

PARTICIPANTS

Office of Naval Research
NAVSEA
Advanced Deployable System Program Office
PMS-183
Raytheon Naval & Maritime Integrated Systems
PSU Applied Research Laboratory (ARL)
Electro-Optics Center